REMARKS

Reconsideration of the application is respectfully requested for the following reasons:

1. <u>Statement that "Applicant's Amendment has Necessitated New Grounds of Rejection"</u>
    This statement in 3 on page 3 of the Official Action of May 13, 2010, is not understood.

The claims were <u>not</u> amended in response to the Office Action of December 16, 2009. Instead, the final rejection was appealed. <u>No amendments were presented with the appeal</u>, much less ones that would have necessitated a new grounds of rejection. It is therefore not clear what "amendments" the Examiner is referring to.

In addition, the statement in item 2 of the current Official Action concerning a "request for continued examination" is not understood. <u>No such request was filed</u>. Instead, the Applicant submitted an appeal and Request for Pre-Appeal Brief review, which apparently resulted in the current new ground of rejection.

2. <u>Amendments to Claims Presented in this Response</u>
    Claim 1 has been amended to recite that irradiation of the luminescence document is carried out using a light source, detection of luminescence radiation is carried out by a spectral sensor, and object allocation is performed by an evaluation device.

Support for these amendments is provided by lines 3-15 on page 5 of the original specification, which describe light source 5, spectral sensor 6, and evaluation device 7, all of which are shown in Fig. 1. As a result, the amendments clearly do **not** involve **"new matter.**

3. <u>Continued Rejection of Claims 1-14 Under 35 USC §101</u>
    In the previous response, the Applicant pointed out that claim 1 positively recited the step of "***irradiating the value document*** *with light, thereby causing the value document including*
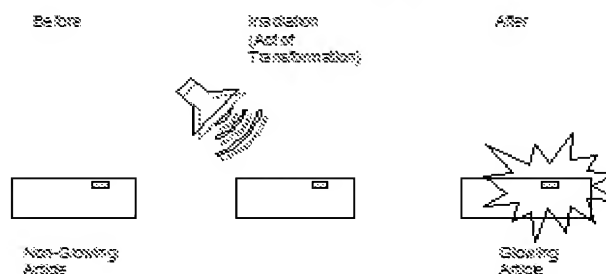
said luminescent substance to emanate luminescence radiation." The Applicant further pointed out that this step caused a **transformation** in the document, thereby meeting the "**machine** or transformation" test set forth in the *Bilski* Federal Circuit case.[1] Unfortunately, this argument that the change in state from non-luminescence to luminescence is a statutory "transformation" was completely <u>ignored</u> in the May 13, 2020 Official Action, which only mentions the "detecting, forming and doing object allocation" steps. According to the Examiner, the detecting, forming and object allocating steps (disregarding the irradiating step and arguments related thereto) could be performed manually, do not require a machine, and do not constitute at transformation.

The Examiner's analysis is wrong for many reasons. First, it does not consider one of the claimed steps, namely the irradiating step. It is not proper to reject a claim as non-statutory by only considering the steps that allegedly could be performed manually and simply ignoring or refusing to consider steps that clearly cannot be performed manually. **There is not a single person n the world that can perform an irradiation without using a machine**. Second, the steps cited by the Examiner, namely detecting radiation and performing vector analysis of the radiation does require a machine, namely a computing device, and cannot be performed manually. Third, even under the old *Bilski* test, **either** a **machine OR** a **<u>TRANSFORMATION</u>** resulted in statutory subject matter, and the claimed invention clearly involved such a transformation. **<u>It is not understood why the Examiner consistently fails to respond to the argument that the claimed invention involves a transformation.</u>** As argued repeatedly, the claimed invention

Transformation from Non-Luminescent State to Luminescent State

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[1] Since the Examiner did not address this issue, it is not clear whether the Examiner considers irradiating a luminescent substance to effect a transformation. However, if the Examiner does in fact believe that subjecting an object to radiation does not transform the object, the Examiner observe the effects of a microwave oven, or ask for an x-ray without a lead shield.

does involve a transformation, ***therefore clearly meeting the machine OR transformation test***.

Despite the complete lack of merit to the continued rejection under 35 USC §101, the Applicant wishes to avoid the expense and delay of a further appeal by offering still further arguments against the rejection, and even amendments of the claims, as follows:

a.   New *Bilski* Guidelines (Taking Into Account the *Bilski* Supreme Court Case)

The following is taken from the "101 Method Eligibility Quick Reference Sheet" published by the USPTO on July 27, 2010, and which was distributed to examiners following the decision of the U.S. Supreme Court in *Bilski et al. v. Kappos* on June 28, 2010, with application to the present case included in the right-hand column:

Post-*Bilski* Guidelines	Applicability to Claims 1-14
Factors Weighing Toward Eligibility:	
● Recitation of a machine or transformation (either express or inherent).	The claims recite a transformation of a document to a luminescent state. It is inherent that a machine is required both to carry out the irradiation step and the vector analysis. The Examiner will note that the guidelines refer to "inherent" as well as "express" recitations. In addition, it is noted that machine recitations have been added to claim 1.
o Machine or transformation is particular.	The transformation is very particular. It involves transformation of a document from a non-luminescent to a luminescent state.
o Machine or transformation meaningfully limits the execution of the steps.	Irradiation of the document is absolutely essential to the remaining steps. If the document is not irradiated, it cannot luminescence, in which case there would be nothing to analyze using object allocation.
o Machine implements the claimed steps.	As noted above, all of the claimed steps require a machine to implement.

o The article being transformed is particular.	The article being transformed is very particular, namely an "a value document having an authenticity feature in the form of at least one luminescent substance."
o The article undergoes a change in state or thing (e.g., objectively different function or use).	The article undergoes a change from a non-luminescent state to a luminescent state, and from an unauthenticated document to an authenticated document.
o The article being transformed is an object or substance.	A value document is an object. In addition, the authenticity feature on the document is specifically recited as a "substance."
• The claim is directed toward applying a law of nature.	The claim applies the principle of luminescence following irradiation.
o Law of nature is practically applied.	Checking the authenticity of document is used in a wide variety of practical applications.
o The application of the law of nature meaningfully limits the execution of the steps.	Application of the principles of luminescence meaningfully limits the execution of the analysis steps since, without the luminescence, there would nothing to detect or analyze using vector formation and object allocation.
• The claim is more than a mere statement of a concept.	The claim involves specific steps that enable checking of a document.
o The claim describes a particular solution to a problem to be solved.	The solution to the problem of document checking involves four very particular steps, including irradiating the value document, detecting the resulting luminescence radiation, forming a measuring vector from measuring values corresponding to different frequencies and/or frequency domains of the luminescence radiation, and performing an object allocation.

○ The claim implements a concept in some tangible way.	This method, when applied, in the claimed manner, is clearly tangible, *i.e.*, it can put into practice using actual value documents, irradiators, and detectors, and computing device(s).
○ The performance of the steps is observable and verifiable.	The performance of the above-steps can clearly be observed and verified using value documents known to be authentic.
Factors Weighing Against Eligibility:	
• No recitation of a machine or transformation (either express or inherent).	A transformation is expressly recited, and a machine is inherent. In addition, machine recitations have been explicitly added to claim 1 (see below).
• Insufficient recitation of a machine or transformation.	The transformation is explicitly recited, and the machine-performed steps are clearly necessary to utilization of the transformation.
○ Involvement of machine, or transformation, with the steps is merely nominally, insignificantly, or tangentially related to the performance of the steps, e.g., data gathering, or merely recites a field in which the method is intended to be applied.	As explained above, the transformation (irradiation to cause luminescence) is essential to the method, and therefore clearly not insignificantly or tangentially related–not only does the invention "gather data," it creates the data by irradiation, and uses the data to achieve the objectives of the invention.
○ Machine is generically recited such that it covers any machine capable of performing the claimed step(s).	The claim is a method claim and is supposed to cover all implementations of the method.
○ Machine is merely an object on which the method operates.	The inherent machines, including an irradiator and computer, are essential to practicing the method.
○ Transformation involves only a change in position or location of article.	The transformation is from a non-luminescent state to a luminescent state, and is not just a change in position or location.

o "Article" is merely a general concept (see notes below).	A specific "article" is involved, namely a "value document having an authenticity feature."
● The claim is not directed to an application of a law of nature.	The claim clearly involves an application of laws of nature rather than a law of nature *per se.*
o The claim would monopolize a natural force or patent a scientific fact; e.g., by claiming every mode of producing an effect of that law of nature.	The claim does not monopolize any natural force (luminescence can be used in numerous contexts, including lighting and even document authentication that does not involve the claimed vector formation or object allocation.
o Law of nature is applied in a merely subjective determination.	The analysis of the luminescence is clearly quantitative and not subjective.
o Law of nature is merely nominally, insignificantly, or tangentially related to the performance of the steps.	Luminescence is substantially related to the performance of the steps.
● The claim is a mere statement of a general concept (see notes below for examples).	The claim clearly does not involve a mere statement of a general concept, exemplified by the "notes" below.
o Use of the concept, as expressed in the method, would effectively grant a monopoly over the concept.	Applicant, like every Applicant for patent, seeks a monopoly over a specific combination of method steps and not over any general "concept" or law of nature.
o Both known and unknown uses of the concept are covered, and can be performed through any existing or future-devised machinery, or even without any apparatus.	The claim recites a specific use, namely checking of a document of value, and clearly cannot be performed without any apparatus.
o The claim only states a problem to be solved.	The claim does not only state a problem to be solved.
o The general concept is disembodied.	There is no recitation of a disembodied general concept.

o The mechanism(s) by which the steps are implemented is subjective or imperceptible.	The mechanisms by which the steps are implemented are neither subjective nor imperceptible.
NOTES: **1) Examples of general concepts include, but are not limited, to:**	
• Basic economic practices or theories (e.g., hedging, insurance, financial transactions, marketing);	Not a basic economic practice or theory
• Basic legal theories (e.g., contracts, dispute resolution, rules of law);	Not a legal theory
• Mathematical concepts (e.g., algorithms, spatial relationships, geometry);	Not a mathematical concept (instead, applies basic mathematical concepts to a specific problem following clearly non-mathematical steps (irradiating and detecting)
• Mental activity (e.g., forming a judgment, observation, evaluation, or opinion);	Not a mental activity
• Interpersonal interactions or relationships (e.g., conversing, dating);	Not an interpersonal interaction or relationship
• Teaching concepts (e.g., memorization, repetition);	Does not involve teaching
• Human behavior (e.g., exercising, wearing clothing, following rules or instructions);	Has nothing to do with human behavior
• Instructing "how business should be conducted."	Does not instruct how business should be conducted

b.   Amendments to Claims

Although the current claims are clearly in compliance both with the old and new *Bilski* guidelines, claim 1 has been amended to further recite the radiation (light)source, spectral sensor, and evaluation device, which are all supported by the original specification, as explained above.

For all of the above reasons, withdrawal of the rejection under 35 USC §101 is respectfully requested.

4.   Rejection of Claims 1-11 and 15 Under 35 USC §102(b) in view of U.S. Patent No. 5,678,677 (Baudat) in view of U.S. Patent No. 4,277,774 (Fujii)

This rejection is respectfully traversed on the grounds that the Baudat and Fujii patents fail to disclose or suggest, whether considered individually or in any reasonable combination, a method of determining whether an authenticity feature is present in a value document by:

- detecting a **luminescence radiation** spectrum emanating from the document (*i.e.*, the claimed "different frequencies and/or frequency domains of the luminance radiation");
- forming a measuring vector from the spectrum; and
- checking whether the measuring vector is located in an "allocation area" corresponding to a given reference vector (the reference vector corresponding to an authenticity feature).

Instead of teaching detection of luminescence radiation, the Baudat patent teaches detection of an object's reflectivity, and does not teach the claimed object allocation. Furthermore, instead of using any sort of spectrum analysis, much less analysis involving forming a measuring vector from the spectrum and objection allocation, Fujii merely teaches pattern matching of a pulse train generated as a luminescing value document is fed past a detector. Thus, **neither reference** teaches **spectral analysis** of luminescence radiation, much less the claimed steps involving forming a measuring vector from the spectrum (by frequency or frequency domains) and object allocation of the measuring vector to reference vectors, as claimed.

It is true that the Fujii patent at least teaches analysis of luminescence radiation (whereas the previously applied references did not teach any such analysis), but the analysis involves non-

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spectral **comparison of pulses** generated by moving a document past the detector, **the pulses merely indicating whether luminescence is present or not rather than involving any sort of spectrum**, and therefore clearly does not correspond that of to the claimed invention. Since the analysis used by Baudat also does not correspond to the claimed invention (as explained previously and below, the Baudat patent merely discloses **comparing measuring values and classes to find the closest class,** without performing the additional *positively claimed* steps of *generating allocation areas corresponding to the reference vectors and checking whether the measuring vectors are within the allocation areas*), there is no reasonable way that the proposed combination of Fujii and Baudat could have resulted in the claimed invention.

As explained in previous responses, the claimed method differs from the method of Baudat in that the claimed invention checks whether the measuring vector is in a particular "object location area," whereas Baudat simply assigns measuring values to the closest class. Furthermore, the Fujii patent does not teach any sort of measuring vector or object allocation, and therefore clearly does not make up for the deficiencies of the Baudat patent. **Thus, even if it were somehow obvious to apply Baudat's reflectivity analysis to Fujii's luminescence detection, the claimed invention would not have resulted**.

Fujii teaches luminescence analysis by feeding an irradiated bill past a photodetector 6, and comparing the voltage with a reference using a voltage comparator 9 **in order to detect whether luminescence radiation is present or not in a particular area of the document**. The resulting pulse train is then simply gated with a reference using an AND circuit 12 in order to analyze the pulse train. **This method of luminescence analysis does not and cannot involve any sort of frequency or frequency domain conversion, vector generation, or allocation to reference vectors, as claimed**. Therefore, Fujii could not possibly have suggested modification of the method of Baudat to obtain the claimed method.

Claim 1 specifically recites:

. . .allocating at least one object allocation area. . .to each reference vector and checking which object allocation area. . .the measuring vector. . .is located in

> *to determine whether an authenticity feature corresponding to one of the reference vectors is present in the value document* [claim 1].

This enables authentication of a document because the measuring vector may or may not be in a particular object location area, depending on whether an authentication feature is present in the document. Nothing in either the Fujii or Baudat patents even remotely resembles this step.. Since the Baudat patent merely discloses comparing measuring values and classes to find the closest class, without performing the additional *positively claimed* steps of generating allocation areas corresponding to the reference vectors and checking whether the measuring vectors are within the allocation areas, as argued in the previous response, the method of Baudat clearly does not correspond to that of the claimed invention. Since the Fujii patent merely teaches a time domain voltage level comparison, Fujii also does not teach this aspect of the claimed invention.

Furthermore, there is a fundamental difference between the way that luminescence spectra and reflectivity patterns are analyzed that would prevent combination of the methods of Fujii and Baudat in the first place. Because every note has a denomination, Baudat assumes that whatever class the measuring values are closest to is in fact the class to which the measuring values belong (once the note has been determined to be authentic in a preprocessing step). This assumption cannot be made when checking authenticity. Because of the assumption that each vector has a valid class, Baudat does consider the possibility that the measuring vector might not be in any class. Thus, while It is true that col. 4 of Baudat mentions an "allocation," the "allocation" described in col. 4 of the Baudat patent has nothing to do with the claimed "allocation." Instead, the allocation described in col. 4 of Baudat is part of a preprocessing step that is entirely separate from the class assignment step used to determine denomination. The preprocessing step is used solely to determine if the processing should continue, and does not result in any identification of an authentication feature, much less a classification depending on luminescent spectra or allocation of measuring *vectors* based on the spectra to areas that correspond to reference values. In Baudat, if the measuring values are outside different areas, then the document is a forgery, and further processing is ended. Unlike the claimed allocation areas, the relevant areas of Baudat do not correspond to reference vectors and do not identify any particular features. Instead, if the measuring values are inside any area, then the method of

Baudat proceeds to find the closes pattern class. <u>At no time does Baudat check whether the</u> <u>measuring values are in *one* of a plurality of areas in order to determine the presence of a feature</u> <u>corresponding to the area</u>.

In summary, neither the Fujii patent nor the Baudat patent discloses or suggests the claimed identification of authentication features by spectral analysis of luminescence radiation based on whether a measuring vector is present in an allocation area, the allocation corresponding to a reference vector identified with a particular authentication feature. To the contrary, neither Baudat nor Fujii teaches any sort of spectral analysis. Therefore, neither Baudat nor Fujii could reasonably have been combined to obtain the claimed invention, and withdrawal of the rejection under 35 USC §1103(a) is respectfully requested.

5. <u>Rejection of Claims 12-14 Under 35 USC §103(a) in view of U.S. Patent Nos. 5,678,677</u>
    <u>(Baudat), 7,330,606 (Fujii), and 7,330,606 (Yakhini)</u>

This rejection is again respectfully traversed on the grounds that the Yakhini patent, like the Baudat and Fujii patents, fails to disclose or suggest a method of determining whether an authenticity feature is present in a value document by detecting a luminescence radiation **spectrum** emanating from the document; **forming a measuring vector from the spectrum**; and **checking whether the measuring vector is located in an "allocation area" corresponding to a given reference vector** (the reference vector corresponding to an authenticity feature), as recited in claim 1, from which claims 12-14 depend. Instead, Yakhini is directed to an method for evaluating the orientation of a molecular array obtained by scanning the molecular array to determine data signals emanating from discrete positions on a surface of the array. As a result, it is respectfully submitted that the Yakhini patent does not suggest either the claimed *luminescence* spectrum or the claimed determination of the presence of authentication features (or any other features) by determining whether measuring vectors based on the spectrum are present in a particular area allocated to a reference vector, as claimed.

Consequently, it is respectfully submitted that the Baudat and Yakhini patents, whether considered individually or in any reasonable combination, fail to disclose or suggest the claimed

invention, and withdrawal of the rejection of claims 12-14 under 35 USC §103(a) is respectfully requested.

6.   Rejection of Claim 16 Under 35 USC §103(a) in view of U.S. Patent Nos. 5,678,677 (Baudat), 7,330,606 (Fujii), and 5,542,518 (Kurosawa)

This rejection is respectfully traversed on the grounds that the Yakhini patent, like the Baudat and Fujii patents, fails to disclose or suggest a method of determining whether an authenticity feature is present in a value document by detecting a luminescence radiation **spectrum** emanating from the document; **forming a measuring vector from the spectrum**; and **checking whether the measuring vector is located in an "allocation area" corresponding to a given reference vector representing a particular authenticity feature**, as recited in claim 1, from which claim 16 depends. Instead, Kurosawa teaches denomination identification based on a <u>spatial</u> distribution of image data, which does not involve any sort of luminescence spectrum or comparison with reference vectors as claimed. Accordingly, withdrawal of the rejection of claim 16 under 35 USC §103(a) is respectfully requested.

7.   Rejection of Claim 18 Under 35 USC §103(a) in view of U.S. Patent Nos. 5,678,677 (Baudat), 7,330,606 (Fujii), and 7,092,583 (Ahlers)

This rejection is respectfully traversed on the grounds that the Ahlers patent, like the Baudat and Fujii patents, fails to disclose or suggest a method of determining whether an authenticity feature is present in a value document by detecting a luminescence radiation **spectrum** emanating from the document; **forming a measuring vector from the spectrum**; and **checking whether the measuring vector is located in an "allocation area" corresponding to a given reference vector representing a particular authenticity feature**, as recited in claim 1, from which claim 18 depends. Instead, the Ahlers patent analyzes the "intensity profile" of emitted radiation over a specified wavelength range. An **intensity profile** is not a **frequency profile** or "spectrum," and is clearly not analyzed in the same way. Accordingly, withdrawal of the rejection of claim 18 under 35 USC §103(a) is respectfully requested.

Having thus overcome each of the rejections made in the Official Action, withdrawal of the rejections and expedited passage of the application to issue is requested.

Respectfully submitted,

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